

Kissinger, Lon

From: Shephard, Burt
Sent: Monday, October 26, 2015 3:12 PM
To: Frank Gobas; Kissinger, Lon
Cc: Greg Frey
Subject: RE: Columbia River basin specific migration times and lipid content changes for chinook and sockeye salmon

Frank,

Thank you for turning around the spreadsheet analyses so quickly. I suspect we'll have some questions once we've had a chance to digest the analyses. If we don't talk with you before you're off to Salt Lake City, enjoy SETAC, and we'll talk when you get back.

Best regards,

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"Facts are stubborn things, but statistics are more pliable"
- Mark Twain

From: Frank Gobas [mailto:gobas@sfu.ca]
Sent: Monday, October 26, 2015 9:12 AM
To: Shephard, Burt; Kissinger, Lon
Cc: Greg Frey
Subject: Re: Columbia River basin specific migration times and lipid content changes for chinook and sockeye salmon

Hi Burt and Lon

Thanks for the information on the salmon. We have put it to good use. I think we managed to complete the project. Please, find attached the model and the results.

The worksheet has 8 tabs, 4 for Chinook (4 different migrations), and 4 for Sockeye (2 different migrations x 2 sexes). I've added a summary of our methods and results in one of the sheets, called summary.

About BCF Model:

- Model is based on a water-exposure Fish Bioaccumulation Model developed from the modellers (Lo et al. 2015, Environ Toxicol Chem. 2015 Oct;34(10):2282-94)

- Model includes QSAR predicted biotransformation (kBM) rate constants, normalized to the size of fish, are also provided in the model (US EPA EPI SUITE v. 4.11)
- Model takes into account changes in body composition due to energy expenditure from salmon migration (Debruyne et al. 2004, Environ Sci Technol. 2004 Dec 1;38(23):6217-24)
- Body composition data is also provided to parameterize fish in the model (US EPA migration data)
- Model also accounts for time dependency due to limited exposure times in freshwater bodies (US EPA migration data)

Risk-based concentrations:

- RBCs are calculated based on temporal BCFs (parameterized to each fish and migration times), fish consumption rate data, and human body weights
- non-threshold-based RBCs are based on a Risk of $1E-6$ and Cancer Slope Factors (CSF)
- threshold-based RBCs are based on given Reference Dose (RfD)

Risk Quotient:

- RQs are calculated based on available US EPA Water Quality Guideline concentrations divided by Risk-based concentrations
- A $RQ > 1$ suggests that the current HH WQG levels may not be protective for human consumption of migrating fish

We have presented the results, graphically. I think that you will be most interested in the RQ graphs. Chemicals for which the $RQ > 1$ indicates that the current WQG may be too low.

I am sure that you will have more questions. Please, let me know if there is more information we can provide.

Best wishes

Frank